

Apr 77

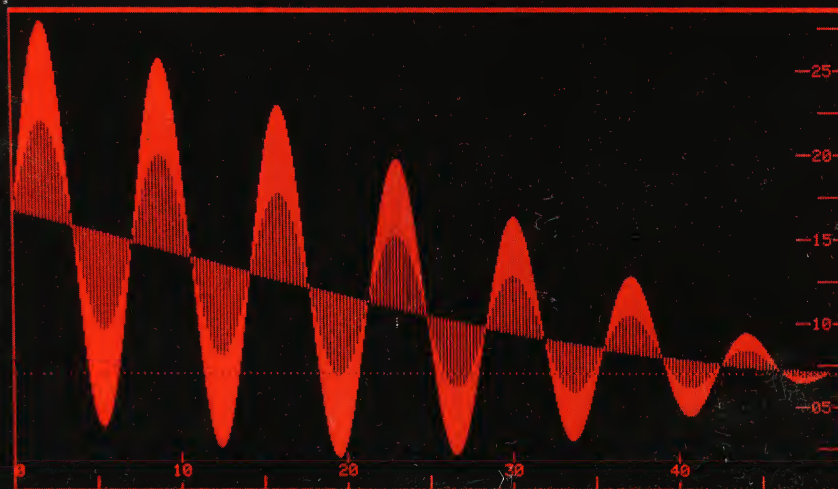
alpha/graphic display terminals

The basic equation of the curve is:

$$Y = \sin(20X) * \sin(X) - \sin(75X)$$

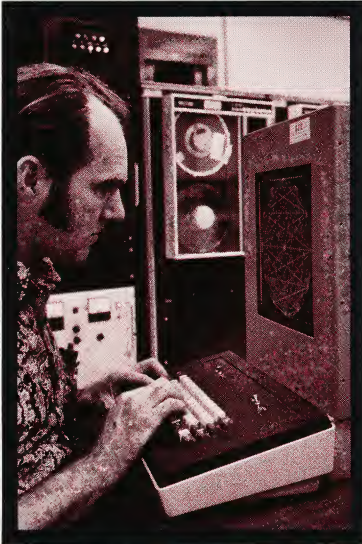
The dotted line @ 7 ERASES every 4'th dot

(NOTE: The X and Y axis scale denotes the absolute position on the PLASMA DISPLAY, divided by ten.)



interstate alpha/gra

A new kind of computer display with



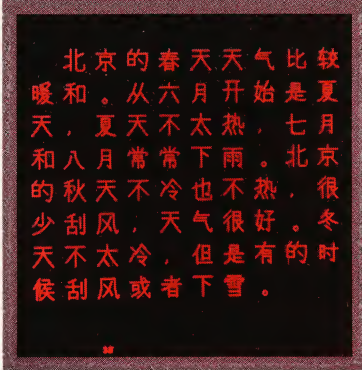
HIGH CONTRAST RATIO: better readability. Since the contrast ratio of the plasma gas display is four times that of the ordinary CRT, Interstate's display screen does not require a light hood, and can be easily viewed from across a brightly illuminated room. With 512 electrodes on each glass sheet, the display matrix panel provides 262,144 physically fixed intersections — or dots — of uniform size.

FLICKER-FREE IMAGE: minimal operator fatigue. In the plasma display, a gas discharge illuminates a specific point on the screen until turned off by a signal from the terminal or the computer. The display image is maintained by a sustaining voltage occurring 50,000 times per second, so there is no perceived flicker. This means that the Interstate display has "self-refresh" and does not require computer refreshing or an expensive local buffer memory; Interstate Terminals free computer memory time for more important transactions.

FLAT SCREEN SURFACE: non-distorted images with exact repeatability. The flat screen and "pin-point" illumination of plasma technology is a considerable improvement over the curved screen and projected image of the CRT. Because of the fixed position of each dot element in a plasma gas display, images can be exactly repeated. The digital-address nature of the plasma terminal's operation eliminates digital-to-analog conversions, preventing another potential source of distortion. With the flat display panel, Interstate's Display Terminals can be viewed from a much wider viewing angle — up to 160°.

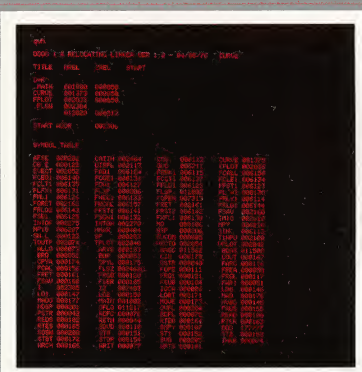
SELECTIVE EDIT/ERASE: versatile data handling. Total erasure of the entire display in order to make additions or modifications is not necessary with Interstate Display Terminals. Since each light intersection in the display matrix is individually addressable, any single point or combination of points that compose any character or graphic image can be erased or changed without disturbing the rest of the displayed image.

MULTIPLE CHARACTER SELECTION: format flexibility. Interstate's standard Display Terminals provide these three character sizes for flexible alphanumeric readouts: 5 x 7 matrix (1/8" characters), 5 x 9 matrix (3/16" characters), and 10 x 14 matrix (1/4" characters). Interstate's character generator is also designed to accommodate scientific symbols, other number/letter sizes, and other linguistic systems including Arabic, Chinese, and Japanese characters for custom requirements.

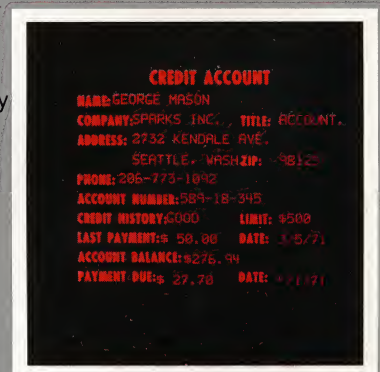


Visual data for every

In work areas that exclude CRT's, and for many special applications



- **Military monitoring posts, data processing centers, and reservation desks:** Operators in any application involving hours of display monitoring appreciate the sharp resolution and high contrast that make Interstate's Display Terminals easily readable.
- **Surveillance, scientific and medical systems:** Many analytical systems require the critical positioning and highly accurate scanning that the plasma display's repeatability can provide.
- **Public monitors in airline terminals, round-the-clock monitoring equipment in hospitals, financial reporting systems in banks and brokerages:** Continuous display systems perform with less maintenance and maximum uptime because of the long-term reliability of Interstate Display Terminals.



Electronic display terminals

Important advantages over CRT's

REAR-PROJECTION/REAR-CAMERA OPTIONS: projected data and comparative analysis. The transparent plasma display panel can be provided with a projection device for rear-screen projection of microfiche film or 35mm slides to produce full-screen images in black-and-white or color. The display terminal's readout can then be used to point out or refer to particular elements in the projected image. The terminal can also be outfitted with a camera to capture hard copies of any display images.



SHALLOW DISPLAY DEPTH: installation in limited physical space. Because the Interstate display is a flat-glass panel, it can be installed in a much shallower space than the depth required for the CRT electron gun. Interstate Display Terminals incorporating this panel occupy less volume and weigh less than standard CRT displays.

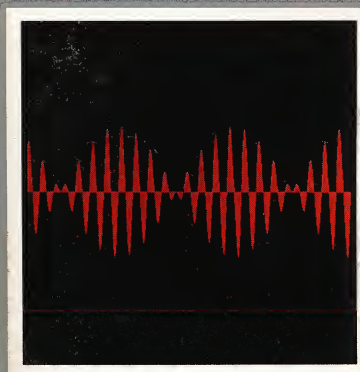
LOW INTERNAL VOLTAGE: safe operation in sensitive environments. The Interstate plasma display generates a maximum of 133 operating volts (DC), as compared with the 25,000 volts DC of the standard refreshed raster-scan CRT, and 20,000 volts DC for the storage CRT. The internal generation of these higher CRT voltages can severely interfere with systems that are sensitive to radiated noise. Interstate Displays Terminals, on the other hand, are electronically quiet. Low-voltage plasma display can also be used at high altitudes without generating a dangerous voltage discharge.

ELECTROMAGNETIC TOLERANCE: reliable performance in magnetic fields. Unlike the CRTs, the plasma gas discharge displays are not sensitive to magnetic fields and can be operated without shielding near such devices as magnetrons and large motors.

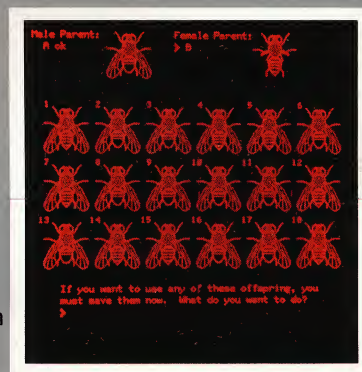
OPERATING RELIABILITY: lower maintenance costs, long-term performance, less downtime. The operating life of the Interstate plasma display is specified at more than 10,000 hours, compared to the 1,000 hour-life of the standard storage CRT's. And because the plasma panel doesn't have filaments, heaters, electron guns, or other precisely aligned electrical components, Interstate Display Terminals do not require mechanical rotation and frequent maintenance. The rugged design of Interstate Terminals and the inherent strength of the plasma panel insure reliable operation even in adverse environments.

Working environment

Interstate Display Terminals provide important user advantages...



- **Monitoring systems for aircraft, seagoing vessels and land vehicles:** Designers of any system in which spatial and weight tolerances are closely specified use Interstate's slim, lightweight plasma panel to conserve payload — and there is no high-voltage EMI to disturb quiet listening systems or other sensitive instrumentation. Portable systems also benefit from the tough construction and operating reliability of Interstate Terminals.
- **Drafting, engineering, education, military mapping and contour reading:** Interactive installations requiring dynamic, alphanumeric/graphic data handling employ Interstate Display Terminal's selective edit/erase, random motion cursor, and rear-projection capabilities for direct manipulation of graphic data.



**Military, ruggedized and custom commercial terminals —
designed for your requirements**

The Interstate terminal unit consists of a flat matrix panel with drive electronics, a display power unit, and a character/graphics generator controlled by a ROM driven microprogrammable computer. A keyboard, function switches, and a variable cursor (joystick) are offered as standard operating controls. Varied input/output devices can also be added, since the display interface is microprogrammable.

Interstate Alpha/Graphic Terminals are packaged in rack-mount or console configurations. The desktop style is compatible with commercial data processing surroundings. Environmental information and military specifications are available for ruggedized/military units. Custom displays that integrate into special systems can be designed with unusual flexibility, due to the unique characteristics of the plasma visual display.



for almost two decades, system users have selected interstate.



Interstate Electronics Corporation has designed, installed, and maintained computer systems for both military and commercial applications, at installations throughout the world. As a military electronics contractor, Interstate has a successful track record in solving a variety of challenging technical problems.

The computer systems manufactured by Interstate have been designed to accommodate a wide range of environments from full mil-spec, to adverse environmental requirements, to commercial laboratory conditions. Out of the company's own demanding system requirements for information display has come Interstate's alpha/graphic display terminal, a superior alternative to CRT displays containing a new-generation technology — the plasma display.



A Superior Display Technology

Originally developed for television, the cathode ray tube was the only display commercially available to the emerging computer industry. Because today's information handling systems command new markets and take on more complex activities, displayed data is playing an increasingly important role in information systems... and, consequently, a new display technology has arrived.

This new medium, the plasma display panel, features a true digital-created image, using light produced by neon gas discharges. The plasma gas display transcends many limitations of the cathode ray technology because the plasma display has been specifically designed for computer-generated information.

The plasma display screen — a matrix panel — is actually a thin glass "sandwich" consisting of two glass sheets, each with parallel conductive electrodes applied to their inner surface. The electrodes on the two sheets, intersecting at right angles, form a matrix of potential intersections. Small glass spacers separate the pieces of glass, and this narrow intervening space is filled with a neon gas mixture. When a voltage pulse is superimposed on any two intersecting electrodes, a gas discharge occurs, forming a spot light. The light dot remains until another voltage signal is applied in a manner that cancels it. An additional AC voltage is continuously applied to all electrodes in the matrix panel, providing the "flicker-free" display image with inherent memory. This display matrix with a total depth of only 0.5" is completely transparent, and therefore can be used to display rear projection images.

alpha/graphic display terminal specifications

Display Size: 8.5" x 8.5" usable display area

Display Matrix
Panel: 512 lines by 512 lines

Individually
Addressable
Elements: 262,144

Dot Size: 10 mils

Resolution: 60 elements per inch

Brightness: 45 fl average to 75 fl peak

Contrast Ratio: 20:1 small area

Maximum Viewing
Angle: 160°

Light Spectrum: 0.5852 micrometer

Color: Neon orange

Panel Writing
Speed: 50,000 elements per second

Interactive
Joystick Provides coordinate position signals from two-axis controller unit which are converted to digital outputs in ASCII format and transmitted to the computer; computer then generates a software cursor.

Character
Generators and
Capabilities: 5 x 7 matrix — 4032 characters
7 x 9 matrix — 1890 characters
10 x 14 matrix — 1008 characters

Character Size: Upper and lower case limits:
5 x 7: 77 mils by 112 mils
7 x 9: 112 mils by 142 mils
10 x 14: 154 mils by 224 mils

Graphic
Generators Endpoint vector generator and incremental point-plot generator

Character Write/
Erase Speed: 833 characters/second for
5 x 7 or 10 x 14 characters
390 characters/second for
7 x 9 characters
833 characters/second for cursor

Bulk Erase Time: 20 microseconds

Bulk Automatic
Self Erase: Occurs approximately 30 minutes after last address

Established as a private firm in 1956, Interstate Electronics creates, develops, and offers electronics test equipment and instrumentation systems to the commercial, industrial, government, and military markets. While employing over 1,400 persons at a 270,000 square-foot complex in Anaheim, California, the company also maintains corporate offices in Washington D.C. and Atlanta, Georgia, and offers customer support through field sales offices in the U.S., and distribution centers in all major over-seas markets.

Interstate Electronics Corporation is a subsidiary of A-T-O, Inc., a diversified international operating company with annual sales of \$500 million, serving six basic markets: electrical/electronic instrumentation and computer systems; fire protection, safety, and security; consumer/recreation products; fluid controls and hydraulics; construction and mining equipment; and packaging machinery/material handling equipment.

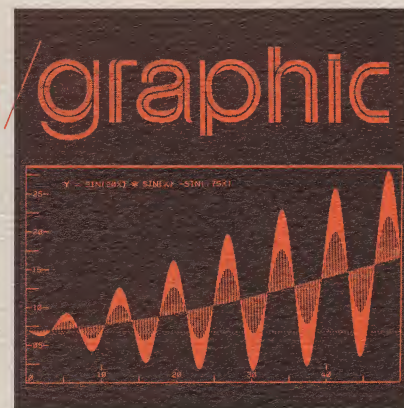
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alpha/graphic display terminal

Model PD 1000



The Interstate Electronics Corporation Alpha/Graphic Model PD 1000 is a rugged computer display terminal intended for use in nonmilitary environments. The Model PD 1000 receives signals from an external computer or its own keyboard, interprets the incoming information, performs addressing, formatting, and control operations required, and displays the requested function on a plasma display panel. The terminal is a table-mounted unit and includes the plasma panel, display drive electronics, power supply, microcontrolled display processor, full alphanumeric keyboard, and dual communications interfaces. Available optional capability includes high-speed parallel input/output, additional function key controls, touch panel, joystick, special keyboard, MIL-STD-188C compatible I/O port, RAM installation, and ROM expansion for programmable character set, scrolling, high-speed data storage, hard copy output, editing, and microfiche projection.

The IEC software product set includes a real-time/high-level macroinstruction set that provides sub-routines for display control, alphanumeric display, incremental and vector graphics. This template package is easily implementable in any computer. Also available are a FORTRAN IV display library, FORTRAN IV terminal diagnostics and exerciser, BASIC language plotting routines, PLOT-10 Terminal Control System Conversion package, and a FORTRAN IV microcode cross-assembler.

- Alphanumeric and graphics display capability is standard
- Inherent panel memory
- Single point write/erase on a flat screen
- Flicker-free and distortion-free presentation
- Constant spot size with no drift
- Low operating voltages
- Excellent display resolution and repeatability
- Very bright display with high contrast ratio and wide viewing angles
- Over 4000 character display capacity
- Completely modular construction
- Rear projection capability
- High speed screen erase
- Comprehensive user software available

DISPLAY CHARACTERISTICS

Character Capacity (with margin control):

5x7 matrix:	4335 characters
7x9 matrix:	2048 characters

Individual Line and Row Capacity:

5x7 matrix:	85 characters/line, 51 rows
7x9 matrix:	64 characters/line, 32 rows

Panel Life:	>10,000 operating hours
Panel Size:	12.25" x 12.25"
Active Display Area:	8.55" x 8.55"
Resolution:	60 elements per inch

Individually Addressable Points: 262,144

Character Size (upper and lower case)

5x7 (matrix = 6x10):	0.077"x0.112" (0.20 cm x 0.28 cm)
7x9 (matrix = 8x16):	0.112"x0.142" (0.28 cm x 0.36 cm)

Dot Spacing: 0.0167" center to center

Vector Address Rate: 50,000 dots per second

Worse Case Vector
Writing Time: 10 milliseconds for 572 points

Brightness:	60 fL (approximately)
Contrast Ratio (small area)	25:1
Light Spectrum:	Neon Orange (5852A predominant)
Dielectric Coatings:	Magnesium Oxide
Full Screen Erase:	20 microseconds
Automatic Bulk Erase:	30 ±7.5 minutes after last address
Parallel Addressing Rate:	8333 characters/second (5x7) 6250 characters/second (7x9)
Serial Data Rate (synchronous or asynchronous):	150 to 19200 baud, switch selectable (9600 and 19200 baud rates require "clear to send" handshake logic)
Display Duty Cycle:	All points can remain lit indefinitely
Flicker:	None perceptible
Alpha Cursor:	Underline and flashing symbol (firmware generated)
Joystick Cursor:	+ symbol (firmware generated option)

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature and Humidity:	0° to 40°C, up to 90% relative humidity (noncondensing)
Storage Temperature:	-40° to +75°C for extended periods
Vibration:	Meets MIL-STD-167, Table 1, vibration test requirements
Ambient Pressure, Operating:	Equal to atmospheric pressure 13,000 feet at 25°C
Nonoperating:	Up to 40,000 feet at -40°C

ELECTRICAL

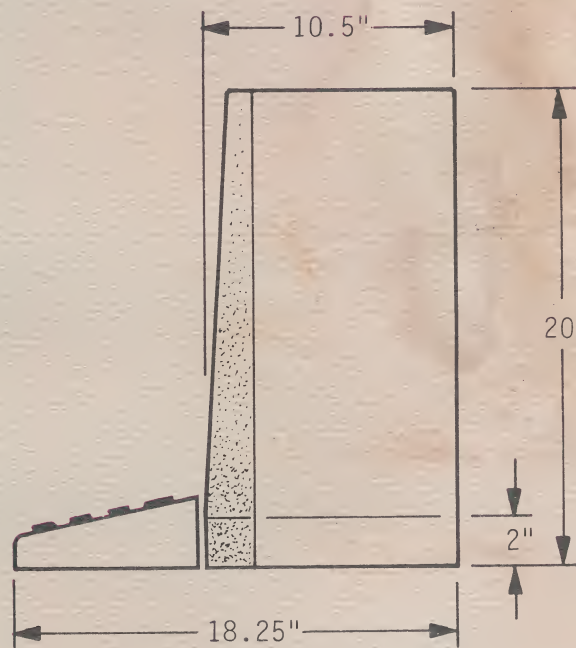
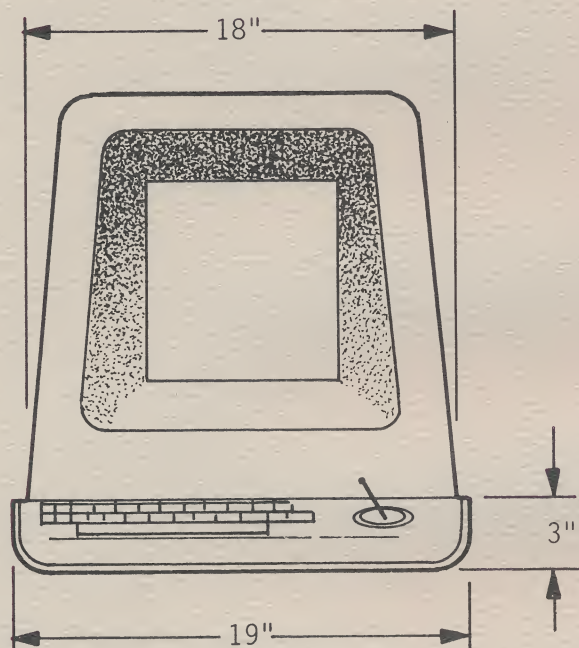
Primary Power: 115 ±10V, 50-60 Hz
(400 Hz optional)

Consumption: 300 watts average

MECHANICAL

Weight: 50 pounds

Size: As shown below. Keyboard is detached



This terminal is one of a family of functionally compatible plasma display terminals designed for reliable operation in commercial/industrial and sheltered, standard, and full tactical military environments.

INTERSTATE ELECTRONICS CORPORATION

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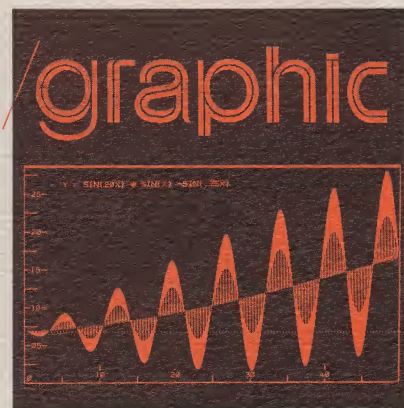
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